

REMARKS

Claims 1-22 are pending in the application. Claims 3-5, (6/3-5) and 7-22 are withdrawn. Claims 1, 2, 6/1 and 6/2 are rejected. Claim 6 is herein amended. Applicants submit that no new matter has been added.

Rejection under 35 U.S.C. §112

Claim 2 and 6/2 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 2, the Examiner asserts that “triangular” (line 2) embodiment (relating to the pyramid/cone embodiment of Fig. 7) is not consistent with the “plate-like” (line 4 of claim 1) embodiment (of Figure 6). The Examiner concludes that claim 2 has limitations directed to two (2) separate embodiments.

Applicants respectfully disagree with this rejection.

Applicants note that Group I elected in response to the previous restriction requirement is connected to Embodiment 1 shown in Figs. 2 to 6 in the specification of the application, and both claims 1 and 2 correspond to Embodiment 1. Claim 2 is a dependent claim of claim 1 and further limits the configuration of probe portion having plate-like form to a triangular form. Applicants note that there is no proscription against a plate having a triangular shape. As long as the triangle is flat in thickness, it is a triangular plate.

Fig. 7, on the other hand, illustrates an example of Embodiment 2 where the probe portion is pyramidal or conic, and its corresponding claim is claim 3. Claim 4 is the claim for limiting the probe portion in Fig. 7 to a triangular pyramid. These claims 3, 4 connected to Embodiment 2 are related to group II, and have not been elected in response to the restriction requirement.

Accordingly, claim 2 is a claim connected only to Embodiment 1 and has nothing to do with Embodiment 2 shown in Fig. 7. Applicants respectfully traverse the rejection.

Rejection under 35 U.S.C. §102

Claims 1, 2 are rejected under 35 U.S.C. §102(b) as being anticipated by Toda et al.

The Examiner asserts that as to claim 1, the view of Fig. 7A may be deemed to be a “front” view, thus illustrating the “front” side. Also, as that side is the “front” side, the “thickness” of the plate is perpendicular to the front, and thus is along the horizontal axis of Fig. 6C. As to claim 2, the Examiner notes the triangular shape of element 1103, and that the two sides (front and back) that define the tip are angled relative to the horizontal “bottom” of the probe portion where section 1103 meets section 1102.

Applicants respectfully submit that even with this creative interpretation, not all of the claimed limitations are taught or suggested by the cited reference.

Applicants note that the Examiner is using Fig. 7A of Toda et al., and appears to be looking at the figure from the side, rather than from the front. If this is the case, then the presently claimed invention includes the following limitations, in particular, limitations (e)-(g):

- (a) an SPM cantilever comprising a support portion,
- (b) a lever portion extended from the support portion

- (c) a probe portion formed at a free end of the lever portion,
- (d) wherein: said probe portion has a generally plate-like form;
- (e) wherein the probe portion has an additionally sharpened terminal end portion;
- (f)₍₁₎ wherein the terminal end portion has its length greater than the plate thickness thereof and ₍₂₎ wherein the terminal end portion is reduced in thickness toward a tip of the terminal end portion; and
- (g) the tip is located inwardly of the planes extended from the front and back sides of a base portion of the plate-like probe portion.

With respect to the above limitations, the following limitations:

- (e) wherein the probe portion has an additionally sharpened terminal end portion;
- and
- (f)₍₁₎ wherein the terminal end portion has its length greater than the plate thickness thereof and ₍₂₎ wherein the terminal end portion is reduced in thickness toward a tip of the terminal end portion (clearly indicated in Fig. 6 and the description thereof);
- and
- (g) the tip is located inwardly of the planes extended from the front and back sides of a base portion of the plate-like probe portion (clearly indicated in Fig. 6 and the description thereof)

do not appear to be met by the cited reference.

Applicants note that a disclosure is made in Toda et al. in column 9, lines 35 to 55 with respect to probe chip 1100 having a support section 1101, cantilever or elastic member section 1102 made of an elastic material extended from the support section, and probe section 1103 formed on a free end thereof. The probe section 1103 therein is in the form of a triangular flat plate and has three ridges terminated at two vertexes 1106 and 1107 at the tip of the probe section. Further, the direction normal to the plane of the flat-plate triangular probe section 1103 is almost parallel to the ridge connecting the two terminal points 1106 and 1107 at the tip.

Furthermore, a disclosure is made therein that "the direction normal to the plane of the cantilever-like elastic member section 1102 is parallel to the direction normal to the plane of the flat-plate triangular probe section 1103. The elastic member section 1102 differs from the probe section 1103 in the thickness and geometry".

Specifically, of the probe chip disclosed in Figs. 6 and 7 of Toda et al., the cantilever-like elastic member section 1102 and probe section 1103 correspond to the lever portion and probe portion, respectively, of the present invention. The probe section 1103 is of a flat-plate triangular form having a uniform thickness thinner as compared to the elastic member section (lever portion) 1102 and has two vertexes 1106 and 1107 of the flat-plate triangular form of the trip.

The Examiner has noted that "Toda et al. teach a SPM cantilever 1102 including: upper (support) portion visible in Figure 7A, lever portion, and a probe portion formed at the lowermost (free) portion of the lever portion, wherein: the probe portion has a plate-like form 1103, the probe portion having a sharpened terminal end portion 1106, 1107, the terminal end portion having a length greater than plate thickness (visible in Figure 6C) and is reduced in thickness

toward a tip of the terminal end portion, and the tip is located inwardly of the planes extended from the front and back sides of a base portion of the plate like probe portion”.

In the probe chip disclosed in Toda et al., however, since the probe section has a uniform thickness though having smaller thickness as compared to the elastic member section (cantilever portion), its thickness is not reduced toward a tip of the terminal end portion unlike claim 1 of the present case. Further, since the tip of the probe section in Toda et al. is formed by the two vertexes on the planes extended from the front and back sides of the plate like probe section, it does not correspond to the additionally sharpened terminal end portion as in claim 1 of the present case and the tip of the terminal end portion thereof is not located inwardly of the planes extended from the front and back sides of a base portion of the probe portion.

As the above, Applicants submit that it is clear that the probe chip disclosed in Toda et al. does not include a teaching or suggestion of the constituent features (e), (f), and (g) of claim 1 of the present case. Accordingly, the invention of claim 1 is believed to be fully patentable.

As to claim 2, the Examiner has stated "note the triangular shape of element 1103, and that the two sides (front and back) that define the tip are angled relative to the horizontal bottom of the probe portion in where section 1103 meets section 1102”.

Applicants submit that the cantilever according to claim 2 is characterized in “two sides containing said terminal end portion are inwardly bent”, but does not purport an angled disposition of the probe portion relative to the level portion. In other words, it is of a configuration where a portion unnecessary for the probe portion is cut off. Applicants note line 2 to 9 of page 13 of the specification and Figs. 2 and 3.

Such configuration of the probe portion defined by claim 2 is totally different from the construction of the probe section disclosed in Toda et al. Accordingly, claim 2 is also fully patentable.

Restrictions under 35 U.S.C. §103

Claims 6/1 and 6/2 are rejected under 35 U.S.C. §103(a) as being unpatentable over Toda et al. The Examiner notes that Toda et al. states that the section 1103 is made of “an elastic material” (col., 9, line 39), but does not expressly state that it is silicon nitride. The Examiner concludes that it would have been obvious to employ silicon nitride as the material because Toda et al. teaches (col. 9, line 27; col. 8, lines 12-15) use of silicon nitride to provide for a tip that provides both reduced wear and greater reproducibility of measurement.

As detailed above, Applicants respectfully submit that the base invention is sufficiently dissimilar so as to be patentably distinct. And because claim 6 is dependent on claim 1 and necessarily includes its limitations, claim 6 should be patentably distinct as well. Applicants respectfully traverse this rejection.

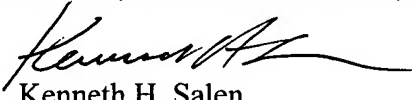
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants’ undersigned attorney to arrange for an interview to expedite the disposition of this case.

Response under 37 C.F.R. §1.111
Attorney Docket No. 032047
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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